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Hackberry



Forest Service

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HACKBERRY

(*Celtis* species)

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The name hackberry is commonly applied to two closely related species—hackberry (*Celtis occidentalis*), which grows in the north-eastern part of the United States, and sugarberry (*C. laevigata*), which grows in the southeastern part.¹ The ranges of the two species overlap to some extent. Both are small to medium-sized trees which grow in limited quantities scattered through the hardwood forests of the eastern States. The two woods are quite similar in appearance and properties.

Hackberry lumber has a yellowish tinge and is made up largely of sapwood. The wood resembles American elm and like it is rated as moderately heavy and moderately strong. Hackberry is used principally for furniture and containers, such as boxes and baskets. The reported production of hackberry lumber in 1942 was about 13,000,000 board feet as compared to a cut of 167,000,000 board feet reported for elm lumber in the same year. The cut of hackberry in 1942 was by far the largest so far reported. It is probable that at least 75 percent of this cut was made up of sugarberry.

Nomenclature.—In the northern part of its range hackberry (*C. occidentalis*) is sometimes called sugarberry and occasionally nettletree and false elm. Sugarberry (*C. laevigata*) is frequently called hackberry and sometimes southern hackberry.

Distribution and growth.—Hackberry (*C. occidentalis*) has a natural range of growth throughout much of the eastern half of the United States except for portions of New England and the Lake States in the extreme north and portions of the South Atlantic and Gulf Coast States in the south (see fig. 1). The tree requires a rich soil and abundant moisture for its best growth but will live and grow on almost any soil and with little moisture—which makes it suitable for planting in semiarid regions for windbreak purposes. Under unfavorable conditions, however, it is frequently of small size and sometimes only a shrub. The species is most abundant and reaches its largest size in the bottom lands of the Ohio River basin. Here mature trees have a height of about 70 feet and a diameter of about 18 inches and when grown under forest conditions the trunk may be clear of branches for 30 feet or more. Occasional specimens have been reported over 100 feet high and over 3 feet in diameter. The tree reaches an age of 150 to 200 years. The bark is sometimes covered with wartlike excrescences or ridges. The seed is contained in a small, purple, cherrylike fruit which is borne in abundance and which is a favorite food for birds, by whom the seeds are given wide distribution. The tree can withstand considerable shade. It grows

¹The name hackberry as used in this leaflet includes these two species unless otherwise indicated. There are, however, a number of species and varieties of the genus *Celtis* of little commercial importance, to some of which the name hackberry or sugarberry is commonly applied.

in mixture with other broadleaf trees such as elm, ash, oak, and hickory. Hackberry (*C. occidentalis*) is in general a healthy tree and is attacked by comparatively few wood-rotting fungi and insects.

Sugarberry (*C. laevigata*) grows in the southeastern part of the United States (see fig. 2). Its range overlaps the southern portions of the range of its close relative, hackberry (*C. occidentalis*), but extends considerably farther south.² Sugarberry is a small to medium-sized tree. It thrives on the low, wet, flat areas common in the Missis-



FIGURE 1.—Range of hackberry (*Celtis occidentalis*).

sippi Delta and the Gulf States and along the banks of streams, but will grow under a considerable range of soil and moisture conditions. Mature forest trees grown under favorable conditions are generally about 18 inches in diameter and 80 feet in height with straight trunks clear of branches for approximately 30 feet. Occasional trees may be 3 feet in diameter. The tree grows in mixture with various other southern hardwoods. The bark is thin and easily injured by fire. The tree may be readily recognized by the prominent wartlike excres-

² The range of sugarberry extends from southern Texas into Mexico. It is also found in the Bermuda Islands.

cences³ that frequently occur on the bark. The seeds are contained in a small, yellow, cherrylike fruit similar to the fruit of hackberry (*C. occidentalis*) except in color, and are also widely distributed by birds.

Supply.—Definite information on the stand of hackberry is available only for a very limited portion of its total range. In a forest survey made in the southeastern part of the United States,⁴ the only region that contained enough hackberry of saw-timber size to justify listing



FIGURE 2.—Range of sugarberry (*Celtis laevigata*).

it separately from other species was the Mississippi Delta.⁵ In this region the stand of hackberry saw timber was 1,105,400,000 board feet. Approximately 45 percent of it was in Louisiana,⁶ 38 percent in Arkansas, and 17 percent in Mississippi. While hackberry is probably more common in the Mississippi Delta than elsewhere, this region

³ These growths may project from the bark 2 inches or more.

⁴ This survey was made by the U. S. Forest Service, Southern Forest Experiment Station during the period from 1931 to 1937 as part of a Forest Survey of the United States and included the States of Florida, Georgia, Alabama, Mississippi, Louisiana, most of Arkansas, and portions of South Carolina, Texas, and Oklahoma.

⁵ The Mississippi Delta includes about one-half of Louisiana, one-third of Arkansas, and one-fifth of Mississippi.

⁶ This is all sugarberry, as hackberry (*C. occidentalis*) does not grow in Louisiana.

represents only a small proportion of the combined range of the two species to which the name is applied. A very rough approximation of the total stand of hackberry would be 3,000,000,000 board feet.

Production.—Hackberry was first listed separately from other species in the lumber production statistics of the Bureau of the Census in 1907. In that year a production of 297,000 board feet was reported. By 1913 production had risen to over 2,000,000 board feet (see fig. 3). After that there was a marked drop and then a gradual rise to a cut of 4,732,000 board feet in 1929. The depression in business following 1929 caused another marked drop. After 1938, reported production rose rapidly because of the demand for lumber brought about by the war and the more thorough coverage of the sawmills (both large and small) which produce hackberry lumber. The 1942 hackberry production (13,000,000 board feet) is by far the largest reported in any one year. A portion of the cut of hackberry, especially prior to the

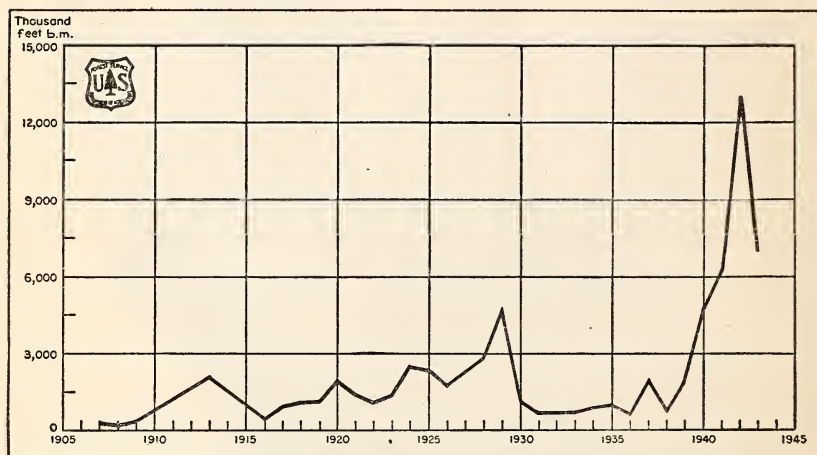


FIGURE 3.—Lumber production of hackberry (*Celtis occidentalis*) and sugarberry (*Celtis laevigata*), 1907–43.

last few years, has undoubtedly been included in the cut of elm and reported as such. The average annual production for the 10-year period 1933–1942 was 3,200,000 board feet. The 1942 cut came from 17 different States of which Mississippi, Louisiana, Arkansas, Oklahoma, and Alabama in the order named were the largest producers. Three of these States (Mississippi, Louisiana, and Arkansas) accounted for over 60 percent of the 1942 production. Their location with reference to the ranges of hackberry (*C. occidentalis*) and sugarberry indicates a considerable preponderance of the latter species in the hackberry lumber on the market. It is estimated that in 1943 production was about 7,000,000 board feet.

Properties.—The sapwood of hackberry varies from a pale yellow to a greenish or grayish yellow. It makes up a large proportion of the log and is usually over 3 inches wide in timber of sawlog size. The heartwood is similar in color to the sapwood but commonly darker, although not always distinctly defined. The annual rings are distinct. The texture of the wood is rather coarse like that of elm

which it resembles in structure. Plain sawed boards⁷ of hackberry, except for the yellow tinge, resemble both elm and ash. The wood is moderately heavy,⁸ moderately strong, moderately weak in compression parallel to grain, moderately hard to hard, high in shock resistance, and lacks stiffness (classed as moderately limber to limber). Hackberry has a moderately large to large shrinkage when dried from a green to an oven-dry condition. It has the reputation of seasoning without a marked tendency to warp and twist. The wood glues easily and satisfactorily with different glues under a wide range of gluing conditions.

A comparison of the machining properties of hackberry and elm is given in table 1.

TABLE 1.—Comparison of machining properties of hackberry and elm by percent of typical pieces in good or excellent condition after various machining operations

Species	Planing	Shaping	Turning	Boring	Mortising
Hackberry.....	74	10	77	99	70
Elm (largely American elm).....	33	11	65	94	75

These figures represent the percentage of typical pieces which were in good to excellent condition after being subjected to the machining operation indicated. Hackberry was considerably ahead of elm in planing and slightly ahead of elm in turning and boring. It was not quite as good as elm in shaping and mortising. When subjected to steam bending hackberry had a higher percentage of unbroken pieces than any of the 25 woods tested. In tendency to split under the action of nails, hackberry is placed in an intermediate class together with a number of commonly used woods such as sweetgum, ash, black tupelo (blackgum), and red oak. In nail-holding power, hackberry also has an intermediate rank.

The susceptibility of the wide sapwood of green hackberry to stain, which shows as unsightly blue or black streaks, has made it necessary to take measures to prevent the action of the fungi⁹ which cause the discoloration.¹⁰ These measures consist of dipping the green boards as they are sawed from the log in a toxic chemical solution which prevents the development of stain fungi. The same chemical solution is also used to spray the ends of the logs if they are to remain in the woods more than a few days. In durability under conditions favorable to decay hackberry has the reputation of being intermediate. The heartwood is difficult to penetrate with a preservative but the sapwood, like that of most species, is comparatively easy to treat. The wood of hackberry does not impart taste or odor to foodstuffs in contact with it.

Hackberry can be readily pulped by the sulfite process to produce an exceptionally light-colored pulp that is easily bleached. It also pulps readily by the soda process but the pulp is rather difficult to bleach.

⁷ Plain sawed (flat grain) boards are those in which the annual rings form an angle of less than 45° with the surface of the piece.

⁸ The average weight of hackberry (*C. occidentalis*) in an air-dry condition (12 percent moisture) is 37 pounds per cubic foot and that of sugarberry (*C. laevigata*), 36 pounds per cubic foot.

⁹ Sap-staining fungi live primarily on substances contained in the various cell cavities of the sapwood, while decay-producing fungi feed on constituents of the cell walls. The former have little effect on the wood except to mar its appearance, while the latter, even in their early stages, may cause a marked drop in strength.

¹⁰ After lumber has been dried to a moisture content less than 20 percent it will not stain or decay unless it is subjected to conditions that raise the moisture content.

Principal uses.—A large proportion of the hackberry cut in the forest is sawed into lumber and a smaller proportion into dimension stock.¹¹ A very limited amount goes into veneer. This lumber, dimension stock, and veneer is used principally for furniture and to a less extent for boxes, baskets, and other containers. Minor uses of hackberry are burial caskets and athletic goods.

Table 2 shows the amounts of hackberry used in the manufacture of wooden products in 1912, 1928, 1933, and 1940. The quantities given include hackberry in the form of lumber, bolts, logs, and veneer.

TABLE 2.—*Hackberry used in the manufacture of wooden products*

[Thousands of board feet]

Classes of products	1912	1928	1933	1940
Boxes, baskets and crates.....	315	231	1,964	1,213
Caskets and burial boxes.....				92
Fixtures.....	6			
Furniture.....	70	1,310	603	3,313
Instruments, musical.....		4		
Laundry appliances.....			4	
Planing mill products, sash, doors, blinds, and general millwork.....	441	50	14	
Refrigerators and kitchen cabinets.....		719		
Saddles and harness.....	46			
Sporting and athletic goods.....			110	64
Vehicles.....	100	2,245	278	
Woodenware, novelties, and dairymen's, poultryers' and apiarists' supplies.....	150			
Total.....	1,128	4,559	2,963	4,682

¹ Includes flooring only.

² Entire amount used for motor vehicles.

³ This figure is made up of 3,893,000 board feet of lumber, 785,000 board feet of logs and bolts shipped direct to plants that manufacture wooden products and not to sawmills, and the equivalent of 4,000 board feet of veneer.

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¹¹ Dimension stock consists of pieces sawed directly from the log or bolt to the approximate sizes required for further manufacture into finished parts for furniture, motor truck frames, turned articles, etc.